REMARKS

INTRODUCTION

In accordance with the foregoing, claims 1-7, 11, 12 and 14-26 have been amended. Claims 27-33 have been added. No new matter is being presented, and approval and entry are respectfully requested.

Claims 1-33 are pending and under consideration.

OBJECTED-TO CLAIM 17 NOW ALLOWABLE

Claim 17 has been drafted in independent form. Withdrawal of the objection to claim 17 due to its dependence on a rejected claim is respectfully requested.

PRESENT INVENTION

In one aspect, the present invention relates to a system for automatically determining a display characteristic. A display characteristic can be, for example, luminance, color temperature, etc. Display characteristics are sometimes set in the display, but the actual or effective characteristic is often different and unknown. The present invention displays a predetermined color value (color chart), and a user indicates a perceived category of the color (e.g. blue, purple, etc.), which is used to automatically determine the effective, approximate or actual display characteristic. The determined characteristic can be used to generate a color profile, such as an ICC color profile.

The characteristic may be automatically determined because a same color value (e.g. R,G,B value) may be perceived to be in different but similar or chromaticity-adjacent color perception categories or areas (e.g blue and purple) when it is displayed according to different values of the characteristic. For example, a high luminance characteristic may cause a particular color value to be displayed such that it is perceived to be in the blue color category, and a low luminance may cause the same (or similar) particular color value to be displayed such that it is perceived to be in the purple category. Thus, human perception can be used to determine a value of the luminance characteristic (e.g., whether it is high or low).

Two features related to this aspect of the present invention are not found in the prior art. These features, in varying form and scope, are discussed below with reference to the claims; (a) interactively indicating or identifying a perceived color perception category, and (b) using the color perception category to automatically determine a characteristic of a display. McLaughlin discusses a system for graphically and manually setting internal parameters of a display. McLaughlin does not discuss the features mentioned above.

REJECTIONS UNDER 35 USC § 112, SECOND PARAGRAPH

In the Office Action, at pages 10-13, claims 5, 11, 16, and 19-22 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. This rejection is traversed and reconsideration is requested.

The feature of claims 5, 11, and 20-22 has been amended for readability. It is respectfully noted that *adjacent* color perception areas, are necessarily mutually different. The Merriam-Webster Dictionary notes that "adjacent" may be used to indicate "a common endpoint or border <adjacent lots> <adjacent sides of a triangle>".

Claim 16 has been amended to recite chromaticity areas of *different* color perception categories.

Claim 19 was rejected because "and up" was found unclear. This term was intended to indicate a minimum ratio. Claim 19 has been reworded to recite "each of the plurality of monochrome figures being displayed with such a color that *at least* a predetermined ratio of persons recognize it as the color of the specified color name under an associated luminance".

Withdrawal of the § 112 rejection is respectfully requested.

REJECTIONS UNDER 35 USC § 103

In the Office Action, at pages 2-7, claims 1-4, 6-8, 12-15, 18, and 23-26 were rejected under 35 U.S.C. § 103 as being unpatentable over Mclaughlin et al. (US 5739809). This rejection is traversed and reconsideration is requested. In the Office Action, at pages 7-9, claims 9 and 10 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Mclaughlin et al. in view of Tanaka (US 5943036). This rejection is traversed and reconsideration is

requested.

INTERACTIVELY INDICATING PERCEIVED COLOR PERCEPTION CATEGORY

The claims recite identifying or indicating: a perceived color perception category, a perceived color perception area, etc. The rejection cited column 15, lines 12-36 of McLaughlin. However, this portion of McLaughlin discusses a user adjusting virtual controls "to match the printed image". Thus, McLaughlin is concerned with matching a specific particular color, not identifying or indicating a more general color perception category. A color perception category may include various gradations of colors that tend to be perceived to be approximately the same or similar.

AUTOMATICALLY DETERMINING A DISPLAY CHARACTERISTIC

The claims previously recited "determining" a display characteristic (e.g. luminance, color temperature, etc.) The rejection equated "determining" the display characteristic with McLaughlin's inputting of display parameters. The Merriam-Webster dictionary notes one use of "determine" is: to find out or come to a decision about by investigation, reasoning, or calculation <determine the answer to the problem> <determine a position at sea>.

It is respectfully noted that McLaughlin's inputting a display parameter, whether by name or number, is not a "determining" process, it is an inputting process. The claims have been amended only to clarify the implicit understanding that a characteristic recognition system/method *automatically* determines the display characteristic. For example, claim 1 now recites "automatically determining ... the display characteristic".

In one aspect, automatically determining a display characteristic may be based on "color ambiguity" - the possibility of a color to be perceived in different yet nearby or adjacent color categories, according to the value of the display characteristics. McLaughlin does not discuss how a possibly unknown display characteristic can be automatically determined.

Withdrawal of the rejection of the independent claims is respectfully requested.

OTHER CLARIFYING AND BROADENING AMENDMENTS EXPLAINED

Before this amendment, the claims recited "a color name input unit entering a name of a color". As is apparent from the drawings (e.g. Figures 8 and 9), different techniques for

indicating or identifying a color perception category may be used; naming a color is one of many possible approaches. The claims have been amended to more broadly recite this feature. For example, claim 1 now recites "an input unit receiving interactive input identifying or indicating a perceived color perception category"

The claims have also been amended to clarify an aspect of a color chart. Because the term "color chart" may be a new term of art, the claims have been amended to clarify a feature of a color chart. The claims have been amended to recite that a color chart has or represents a color value (e.g. a color triplet such as R=100, G=150, B=30). A color value of a color chart can be a point on a chromaticity diagram, and may appear different when displayed with different values of a display characteristic.

The claims have also been broadened to not require determining multiple display characteristics; the claims now cover determining one or more display characteristic.

DEPENDENT CLAIMS

The dependent claims are deemed patentable due at least to their dependence from allowable independent claims. These claims are also patentable due to their recitation of independently distinguishing features. For example, claim 12 recites "generating data representative of display characteristics determined by said display characteristics identification unit *in a predetermined format* to produce a profile representative of characteristics" of the display. This feature is not taught or suggested by the prior art. Withdrawal of the rejection of the dependent claims is respectfully requested.

NEW CLAIMS

New claims 27-33 have been added to clarify another aspect of the automatically determining a display characteristic.

CONCLUSION

There being no further outstanding objections or rejections, it is submitted that the application is in condition for allowance. An early action to that effect is courteously solicited.

Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

Please AMEND the claims in accordance with the following:

1. (TWICE AMENDED) A display characteristics recognition apparatus comprising:

a signal output unit connected to a display unit [for] displaying an image according to a signal entered, said display unit displaying the image with a color displayed according to both the signal and a display [characteristics] characteristic of said display unit, said signal output unit outputting a color chart signal representative of a [monochrome figure] color value to said display unit;

[a color name] an input unit receiving interactive input identifying or indicating [entering] a [name] perceived color perception category of [a] the color displayed on said display unit in accordance with the color chart signal outputted from said signal output unit; and

a display characteristics identification unit automatically determining a value approximating the display [characteristics] characteristic of said display unit in accordance with the color value of the color chart signal outputted from said signal output unit and in accordance with the interactive input [name of the color] entered through said [color name] input unit.

2. (TWICE AMENDED) A display characteristics recognition apparatus according to claim 1, wherein said display characteristics identification unit determines, as the display [characteristics] characteristic, a relationship between a signal representative of a white image and a color of an image displayed on said display unit in accordance with the signal.

3. (TWICE AMENDED) A display characteristics recognition apparatus according to claim 2, wherein said display unit is selectively set up to [anyone] any one of a plurality of display characteristics, and

said display characteristics identification unit determines display characteristics parameters to which said display unit is [now] set up.

4. (TWICE AMENDED) A display characteristics recognition apparatus according to claim 1, wherein said display unit is a display in which an image is displayed through emission of light, and

said display characteristics identification unit determines, as the display [characteristics] characteristic, luminance of said display.

5. (TWICE AMENDED) A display characteristics recognition apparatus according to claim 1, wherein [said signal output unit outputs such a] the color chart signal is such that the color value is in one of two [a] color [of an] perception areas adjacent [area as to colors adjacent] to one another on a chromaticity diagram, and the color chart signal [of a plurality of colors perceived as mutually different colors in name] is displayed in chromaticity according to the display [characteristics] characteristic.

6. (TWICE AMENDED) A display characteristics recognition apparatus according to claim 1, wherein said [color name] input unit enters a name of a color interactively selected from among [a plurality of colors] color names associated with the color value of the color chart signal [perceived as mutually different colors in name].

7. (TWICE AMENDED) A display characteristics recognition apparatus according to claim 1, wherein said signal output unit outputs to the display unit a plurality of color chart signals each representative of a monochrome figure with a different color value to said display unit;

said [color name] input unit enters a name of a color of each of a plurality of monochrome figures; and

said display characteristics identification unit determines the display characteristic [characteristics] of said display unit in accordance with the color values of the plurality of color chart signals outputted from said signal output unit and the plurality of names of the color entered through said color name input unit.

8. (TWICE AMENDED) A display characteristics recognition apparatus according to claim 7, wherein said signal output unit outputs one of the plurality of color chart signals, and thereafter outputs, of the plurality of color chart signals, a color chart signal according to the name entered through said [color name] input unit to said display unit.

9. (ONCE AMENDED) A display characteristics recognition apparatus according to claim 1, wherein said signal output unit outputs the color chart signal to said display unit, and in addition outputs to said display unit a signal causing black to be displayed around the

monochrome figure displayed on said display unit according to the color chart signal.

10. (ONCE AMENDED) A display characteristics recognition apparatus according to claim 1, wherein said signal output unit outputs the color chart signal to said display unit, and in addition outputs to said display unit a signal causing gray to be displayed around the monochrome figure displayed on said display unit according to the color chart signal and further causing black to be displayed around the gray.

11. (TWICE AMENDED) A display characteristics recognition apparatus according to claim 1, wherein said signal output unit outputs a series of color chart signals such that a series of colors in [adjacent] color perception areas [for two sorts of colors] adjacent to one another on a chromaticity diagram are displayed, and

[said color name] the interactive input [unit selects] indicates or identifies a color corresponding to a boundary of the two color perception areas [sorts of colors from among the displayed series of colors].

12. (TWICE AMENDED) A display characteristics recognition apparatus according to claim 1, wherein said display characteristics recognition apparatus further comprises a profile producing unit for generating data representative[,] of display characteristics determined by said display characteristics identification unit in a predetermined format to produce a profile representative of characteristics as to display of an image by said display unit including the data.

13. (ONCE AMENDED) A display characteristics recognition apparatus according to claim 1, wherein said display characteristics recognition apparatus further comprises:

a profile storage unit storing various sorts of profiles each representative of characteristics as to display of an image by a display unit including data indicative of various display characteristics in a common format; and

a profile selection unit selecting one profile from among the various sorts of profiles stored in said profile storage unit in accordance with the display characteristics determined by said display characteristics identification unit.

14. (TWICE AMENDED) A [display characteristics recognition program] storage medium storing a display characteristics recognition program for performing a process, the

process comprising:

[a signal output unit outputting to a display unit for] displaying an image [according to a signal entered, said display unit displaying the image] with a color displayed according to both [the signal and] a display [characteristics] characteristic of [said] a display unit and [, said signal output unit outputting] a color chart [signal] representative of a color value [monochrome figure to said display unit];

[a color name input unit entering] interactively inputting information identifying or indicating a [name] perceived color perception category of [a] the color displayed on said display unit in accordance with the color chart [signal outputted from said signal output unit]; and

[a display characteristics identification unit] automatically determining a value approximating the display [characteristics] characteristic of said display unit in accordance with the color value of the color chart [signal outputted from said signal output unit] and in accordance with the interactively inputted information identifying or indicating the perceived color perception category [name of the color entered through said color name input unit].

15. (TWICE AMENDED) A computer system comprising:

a display [unit for] displaying an image according to a signal entered, said display [unit] displaying the image with a color displayed according to both the signal and a display characteristic [characteristics] of said display [unit];

a main frame unit [for] outputting to said display [unit] a color chart signal indicating [representative of] a color value of a monochrome figure and color name signals, which are representative of a plurality of color names corresponding to the color value, respectively; and

an input unit [for entering] receiving input indicating or identifying a color name interactively selected from among said plurality of color names [to said main frame unit] in accordance with an operation, where the information identifying or indicating the color name is a perceived color of the color value displayed by the display unit according to the color chart signal and the display characteristic,

wherein said main frame unit automatically determines a display [characteristics] characteristic of said display [unit] in accordance with the color chart signal outputted toward said display [unit] and the color name information received [entered] through said input unit.

16. (TWICE AMENDED) A computer system comprising:

a display unit [for] displaying an image according to a signal entered, said display unit

displaying the image with a color displayed according to both the signal and a display characteristic [characteristics] of said display unit;

a main frame unit [for] outputting [to] for display by said display unit a series of color chart signals [such that a series of colors] with color values in adjacent color perception areas [for two sorts of colors adjacent to one another] on a chromaticity diagram, where each area is a different color perception category [are displayed]; and

an input unit for interactively entering information indicating or identifying a perceived color corresponding to a boundary of the [two sorts] color perception categories of colors, which is interactively selected from among the [series of] colors displayed on said display unit, to said main frame unit in accordance with an operation,

wherein said main frame unit automatically determines a display [characteristics] characteristic of said display unit in accordance with the color values of the colors displayed on the [chart signal outputted toward said] display unit and the color information interactively entered through said input unit.

17. (ONCE AMENDED) [A computer system according to claim 16] A computer system comprising:

a display unit for displaying an image according to a signal entered, said display unit displaying the image with a color according to both the signal and display characteristics of said display unit;

a main frame unit for outputting to said display unit a series of color chart signals such that a series of colors in adjacent areas for two sorts of colors adjacent to one another on a chromaticity diagram are displayed; and

an input unit for entering a color corresponding to a boundary of the two sorts of colors, which is selected from among the series of colors displayed on said display unit, to said main frame unit in accordance with an operation,

wherein said main frame unit determines display characteristics of said display unit in accordance with the color chart signal outputted toward said display unit and the color entered through said input unit, wherein said main frame unit outputs to said display unit the series of color chart signals, and in addition a message signal representative of a message inquiring as to from which color of the series of colors displayed on said display unit an operator visually identifies it as a color of a specified color name.

18. (TWICE AMENDED) A computer system comprising:

a display [unit for] displaying an image according to a signal entered, said display [unit] displaying [on a luminous display basis the image with] a color according to both the signal and a luminance display characteristic [characteristics] of said display [unit];

a main frame unit [for outputting to] causing said display to display [unit color chart signals representative of] a plurality of monochrome [figures associated] color patches with mutually different [luminance] luminances of said display unit, each of the plurality of monochrome [figures] color patches being displayed with a same color value [of] corresponding to a specified color name [under an associated luminance]; and

an input unit for interactively selectively [entering a] one of the monochrome figures [figure] displayed with a color of the specified color name of the plurality of monochrome figures displayed on said display unit, to said main frame unit in accordance with an operation,

wherein said main frame unit determines a value of the luminance display characteristic of said display unit in accordance with the color chart signal outputted toward said display unit and the monochrome figure entered through said input unit.

19. (TWICE AMENDED) A computer system according to claim 18, wherein said main frame unit outputs color chart signals representative of a plurality of monochrome figures associated with mutually different luminance of said display unit, each of the plurality of monochrome figures being displayed with such a color that [persons of] at least a predetermined ratio of persons [and up] recognize it as the color of the specified color name under an associated luminance.

20. (TWICE AMENDED) A display characteristics adjusting apparatus for adjusting display characteristics of a display unit for displaying an image according to a signal entered, said display unit displaying the image with a color according to both the signal and display characteristics of said display unit, said display characteristics adjusting apparatus comprising:

a signal output unit outputting a signal for display to said display unit such signal comprising a color chart signal [that] with a color value belonging to an [adjacent] area of a chromaticity diagram that is [as to colors] adjacent to [one] another area on [a] the chromaticity diagram, the areas representing different color perception categories [of a plurality of colors perceived as mutually different colors in name] is displayed on said display unit in accordance with display characteristics of said display unit.

21. (TWICE AMENDED) A display characteristics adjusting program storage medium storing a display characteristics adjusting program incorporated into a computer system, said display characteristics adjusting program causing said computer system to operate a display characteristics adjusting apparatus for adjusting display characteristics of a display unit for displaying an image according to a signal entered, said display unit displaying the image with a color according to both the signal and display characteristics of said display unit, said display characteristics adjusting program comprising:

a signal output unit outputting a signal for display to said display unit such signal comprising a color chart signal [that] with a color value belonging to an [adjacent] area [as to colors] of a chromaticity diagram that is adjacent to [one] another area on [a] the chromaticity diagram, the areas representing different color perception categories [of a plurality of colors perceived as mutually different colors in name is] where the signal is displayed on said display unit in accordance with display characteristics of said display unit.

22. (TWICE AMENDED) A computer system comprising:

a display unit [for] displaying an image according to a signal entered, said display unit displaying the image with a color according to both the signal and display characteristics of said display unit;

an adjusting unit adjusting display characteristics of said display unit in accordance with an operation; and

a main frame unit for outputting a signal for display to said display unit such signal comprising a color chart signal [that] with a color value belonging to an [adjacent] area of a chromaticity diagram that is [as to colors] adjacent to [one] another area on [a] the chromaticity diagram, the areas representing different color perception categories [of a plurality of colors perceived as mutually different colors in name is] where the signal is displayed on said display unit in accordance with display characteristics of said display unit.

23. (ONCE AMENDED) A display characteristics recognition apparatus comprising:

means for displaying an image on a display unit with a color determined by both an input signal and display characteristics of the display unit, and displaying a color chart signal;

means for inputting information identifying or indicating a name of a color displayed in accordance with the color chart signal; and

means for automatically determining display characteristics of said display unit in accordance with the color chart signal and the indicated or identified name of the color[input].

24. (ONCE AMENDED) A method, comprising:

displaying an image on a display unit with a displayed color determined by both an input signal and a display [characteristics] characteristic of the display unit, and displaying a color chart signal that specifies a color value corresponding to the displayed color;

interactively indicating [inputting] a [name] perceived color perception category of [a] the displayed color [displayed in accordance with the color chart signal]; and

automatically determining a value approximating the display [characteristics] characteristic of said display unit [in accordance with] based on the color value corresponding to the color chart signal and based on the indication of the perceived color perception category [name of the color input].

25. (ONCE AMENDED) A computer readable storage storing information for enabling [, controlling] a computer [by,] to perform a process, the process comprising:

displaying an image on a display unit with a displayed color determined by both an input signal and a display [characteristics] characteristic of the display unit, and displaying a color chart signal that specifies a color value corresponding to the displayed color;

interactively indicating [inputting] a [name] perceived color perception category of [a] the displayed color [displayed in accordance with the color chart signal]; and

automatically determining a value approximating the display [characteristics] characteristic of said display unit [in accordance with] based on the color value corresponding to the color chart signal and based on the indication of the perceived color perception category [name of the color input].

26. (ONCE AMENDED) An apparatus, comprising:

a display unit displaying an image on a display unit with a displayed color determined by both an input signal and a display [characteristics] characteristic of the display unit, and displaying a color chart signal that specifies a color value corresponding to the displayed color;

an input unit [inputting] used to interactively indicate a [name] perceived color perception category of [a] the displayed color [displayed in accordance with the color chart signal]; and

a determining unit automatically determining a value approximating the display

[characteristics] characteristic of said display unit [in accordance with] based on the color value corresponding to the color chart signal and based on the indication of the perceived color perception category [name of the color input].

27. (NEW) A method of color calibration, comprising:

displaying a color with a display system;

receiving interactive input identifying or indicating a perceived color perception category of the displayed color; and

automatically determining a value of a characteristic of the display system based on the interactively indicated color perception category.

28. (NEW) A method according to claim 27, wherein the color perception category is one of two different such categories, and the displayed color is susceptible to being perceived in either of the two different color perception categories according to the value of the characteristic, and where the characteristic is one of luminance and color temperature.

29. (NEW) A method of color calibration, comprising:

causing a display system to emit a color, where the emitted color is a product of both an unknown value of a characteristic of the display and a color value passed to the display;

receiving input identifying or indicating a perceived color of the emitted color; and

automatically determining the unknown value of the characteristic of the display based on the perceived color of the emitted color.

30. (NEW) A method according to claim 29, wherein the received input identifies the perceived color as one of white, orange, brown, gray, yellow, purple, pink, red, green, blue, or black.

31. (NEW) A method, comprising:

interactively identifying or indicating a perceived color perception category of a color emitted by a display system;

automatically selecting a value of a characteristic of the display system based on the perceived general category, where the color value is such that, for different display systems, the emitted color of the color value tends to be perceived as being in a first general color category

when emitted with a display system having a first value of the display characteristic, and the emitted color tends to be perceived as being in a second general color category when emitted with a display system having a second value of the display characteristic.

32. (NEW) A method according to claim 31, wherein the automatically selected value of the characteristic of the display system is one of the first and second values of the display characteristic, and wherein the display characteristic is one of luminance and color temperature.

33. (NEW) A method comprising automatically generating a color profile of a display system by interactively identifying perceived color perception categories of predetermined color values displayed by the display system, and matching the perceived color categories to color categories expected to be perceived when displayed with different values of a display characteristic.